

## **The impact of daycare programs on child health, nutrition and development in developing countries**

**3ie Synthetic Review 7 – SR007  
Protocol  
October 2009**

### **Review team:**

Jef L Leroy from the International Food Policy Research Institute (IFPRI) – Lead reviewer  
Paola Gadsden from the Instituto Nacional de Salud Publica (INSP) – Reviewer  
Maite Guijarro from the Centro de Investigación y Docencia Económicas - Reviewer

### **Contact information:**

Jef L Leroy  
International Food Policy Research Institute  
2033 K St, NW  
Washington, DC 20006-1002  
USA

[j.leroy@cgiar.org](mailto:j.leroy@cgiar.org)

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# 1. Background and objectives

## **Background**

Government daycare programs currently under way in several developing countries seek to promote labor force participation through relieving one of the most pressing constraints faced by working parents, especially mothers, i.e. access to reliable and affordable childcare. Many hypothesize that the higher unemployment rates and fewer working hours for females, compared to their male counterparts, are –at least partly- due to conflicting demands on women’s time: taking care of children and working for income.(1,2)

Childcare programs have been hypothesized to increase parental labor market participation and income, and to also affect child outcomes such as nutrition, health and development. Surprisingly, however, there is a dearth of evidence on the impact of these programs in the literature. Zoritch et al.’s (2000) review of randomized and quasi-randomized controlled trials is limited to studies conducted in the US.(3) Based on 8 published trials, the authors concluded that daycare had positive effects on child development, maternal employment and mothers’ interaction with their children. At the same time, however, they emphasized the urgent need for higher quality studies in this area.

## **Objectives**

No reviews of the evidence for developing countries have been conducted, even though a number of impact evaluation studies have been published. We propose a systematic review of the evidence for developing countries.

# 2. Study team

The study team consists of Jef L Leroy, Paola Gadsden and Maite Guijarro. All three members have been closely involved in studying day-care programmes. The team was responsible for conducting the “design evaluation” of the Mexican day-care program. This involved a desk review of the intervention design for the Mexican Evaluation Council. Gadsden and Leroy are further involved in the impact evaluation of the Mexican program day-care program. Additionally, Leroy has extensive experience in studying the impact of large scale social programs on child outcomes and has conducted and published a number of systematic reviews.<sup>1</sup> Guijarro provides the economics expertise through her MSc in economics and her appointment at the CIDE, Mexico's most important center of teaching and research in the social sciences.

The study team will be led by Jef Leroy. The literature searches will be conducted by Leroy and Gadsden, with any disputes (regarding inclusion or interpretation of results) resolved by Guijarro.

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<sup>1</sup> See J. Nutr (2007); 137: 2311 – 2316 (animal production and child nutrition)[Leroy, 2008], Policy and Action for Cancer Prevention Food, Nutrition, and Physical Activity: a Global Perspective; ISBN: 978-0-9722522-4-9 (on the determinants of fruit and vegetable consumption in low and middle-income countries)(4) and J. Dev. Eff. (2009), 2: 103-129 (on the impact of CCTs on child nutrition)(5).

### **3. Methods**

#### ***Scope***

The aim of this study is to present a systematic review of the impact of daycare on the health, nutrition and development of children under 5 years of age in low and middle income countries (as defined by the World Bank). Day care is defined as out-of-home day-care for children younger than 5 years of age. There are no limitations in terms of who provides the day-care (government, private or a combination of both) or in terms of the duration.

Three types of outcomes will be studied: child health (including common childhood illnesses such as diarrhea and acute respiratory infections), child nutrition (child anthropometry, child anemia, child dietary intake, etc) and child development (including psychomotor, sensory, language, cognitive and social-emotional development). It must be noted that the outcomes we will study are not necessarily the outcomes that the providers of day-care have in mind when providing the services. For instance, governments may provide day-care with the objective of increasing female labour participation. Nevertheless, the impact of day-care provision on child outcomes is of utmost importance.

Ideally, we would limit the studies to randomized controlled trials. Some preliminary searches, however, showed that there may not be any RCTs on the impact of daycare on child outcomes in developing countries. As a consequence, it will be necessary to include other types of intervention studies, such as quasi-experimental methods (e.g. propensity score matching), as well as regression-based methods controlling for the potential endogeneity of program participation. The review, however, will be limited to studies examining impact of an intervention and will thus exclude non-intervention studies. We will limit the review to papers published in English, French and Spanish after 1980. The review is undertaken in two stages. Stage one involves identifying studies through database searches. Stage two involves a detailed review of the identified studies.

#### ***Data sources and search strategies***

We will search Pubmed and Econlit using a wide range of terms intended to maximize the number of potentially relevant articles identified. A hand search of relevant journals will be conducted (we will conduct online searches for journals not at hand). In addition, we will add papers suggested by colleagues and search the websites of the Worldbank (including the JOLIS catalog), IFPRI, IDEAS, the British Library for Development Studies and Literatura Latinoamericana y del Caribe en Ciencias de la Salud (LILACS). We will also search Google (limiting the search to the first 2000 hits) and Google Scholar. We will finally contact leading experts regarding unpublished work (e.g. Save the Children's Young Lives Project).

The search strategy combines a group of 'exposure' terms (representing the daycare programs), with 'outcome' terms (child health, nutrition and development), 'subject' terms (children) and 'context' terms (developing countries) (Table 1).

To create the final search syntax, exposure terms will be combined with the outcome, subject and context terms and the diet terms by the Boolean operator "AND" (i.e. 'exposure terms' AND 'outcome terms' AND 'context terms'). Search terms within these four domains are connected by the Boolean operator "OR". The final search strings used within each database are listed in Appendix 1. Where spellings differ between British and American English, we will search for both.

The terms mentioned above will be used within each of the databases to identify relevant indexing terms to be included in the database specific search phrase. EconLit

will be searched using OCLC and PubMed using NCBI. Relevant MeSH (medical subject heading) terms will be identified and included in the PubMed search phrases.

**Table 1 Overview of search terms**

<b>Domain</b>	<b>Description</b>	<b>Search terms</b>
Exposure	<i>Intervention</i>	Child daycare centers, nursery, nursery school, nurseries, pre-school, kindergarten
Outcome	<i>Health</i>	Health, infection, disease, morbidity, diarrhea, diarrhoea, infection
	<i>Nutrition</i>	Diet, nutrition, growth, height, weight, anemia, deficiency, nutrient
	<i>Development</i>	Intelligence, infant development, child development, psychomotor, motor, sensory, language, cognition, social-emotional
Subjects	<i>Children</i>	Child, preschool child*, infant
Context	<i>Low and middle income countries</i>	Developing countries, third world countries, low income countries, middle income countries

### ***Inclusion/Exclusion Criteria***

The selection of articles for full review from the pool obtained during the database searches will be conducted in three phases, with increasing specificity. Papers will be excluded based on study scope, type and quality (Table 2). We will first scan the title to exclude studies that are out of the scope of the review (see below). We will then read the abstract and exclude papers not meeting the criteria for study scope, type and quality. Finally, the remaining papers will be read entirely and excluded if they do not meet the three criteria.

The searches will be conducted by Leroy and Gadsden; any disputes will be resolved by Guijarro.

**Table 2 Overview of exclusion criteria**

<b>Exclusion criterion</b>	<b>Study excluded if...</b>
<b>Study scope</b>	(a) Did NOT either 1) identify how, or the extent to which, day care is associated with, or predict child health, nutrition or development OR 2) evaluate the impact of a daycare intervention on these child outcomes. (b) Study's main focus was on disabled children, orphans, children living with HIV/AIDS, child abuse, ... (c) Study's describes the situation in daycare centers or the quality of services provided.
<b>Study type<sup>#</sup></b>	(a) editorials, commentaries or book reviews; (b) policy documents; (c) surveys solely reporting the prevalence or incidence of the use of daycare centers or the prevalence or incidence of diseases, malnutrition, dietary patterns of children attending daycare centers; (d) non-systematic reviews; (e) non-evaluated interventions; (f) theoretical or methodological studies only; (g) single-case studies; (h) studies that evaluated the process of interventions only.

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<b>Study quality</b>	<ul style="list-style-type: none"> <li>(d) studies not including a measure of child level health, nutrition or development as the dependent variable</li> <li>(e) quantitative and qualitative studies that did not provide sufficient details about the procedures followed for data analysis;</li> <li>(f) quantitative studies that did not report statistical tests on the studied associations;</li> <li>(g) quantitative studies that only used univariate methods for data analysis (i.e. do not control for confounding).</li> <li>(h) Coefficients and level of significance not reported numerically or graphically</li> </ul>
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#Adjusted from Sheperd *et al.* (6)

### **Detailed review**

**Extraction of study data** - The studies that meet the inclusion criteria will be reviewed in depth, their characteristics will be described and their results synthesized. Data extraction tables will be used to facilitate the greatest possible synthesis. Data will be summarized into the following categories: focus (country, exposure and outcome), methods (study design, collection of dietary data), sample characteristics (sample size, age, gender, study population), data analysis (univariate or multivariate, confounders controlled for), whether the coefficients were reported, concerns about the study and finally the study findings.

**Assessment of study quality** - We will use standard criteria to determine the quality of methodology used in the reviewed studies. The following characteristics will be used: the type of study (cohort, case control,...), number of participants, the age range, socio-economic and/or ethnic background, original sample size and analyzed sample, the characteristics of the individuals lost, control for confounding variables and the adequacy of the analytical and statistical procedures.

### **Data analysis**

The results of the review will be summarized by study outcome.

### **Program theory**

We will pay special attention to documenting the evidence regarding potential pathways of impact using a program theory framework. We will first review the evidence on the impact of daycare on child outcomes. We will then use a program theory framework to review the evidence regarding the pathways through which daycare may improve child outcomes. 'Program theory' refers to defining the processes by which a program is intended to achieve its impacts.(6) Rigorous, theory-driven evaluations allow for the best understanding of whether, why, and how programs achieve, or do not achieve, their intended impacts.(7) This explains the importance of using program theory in reviewing the literature on program impact.

## **4. Results**

The results of the searches will be summarized in Table 3.

**Table 3 Summary of the study selection process**

<b>Description</b>	<b>Number of studies from PubMed</b>	<b>Number of studies from Econlit</b>
Papers identified through initial database search		
Papers requested in full paper form for second-level review		
Papers obtained in time for potential inclusion in review		
Papers from second-level review that met inclusion/exclusion criteria and are included in the review		
Papers obtained through other means and included in the review		
Total papers included that met inclusion/exclusion criteria and are included in the review		

The results of this review will be written up in the following subsections:

- Detailed descriptions of the include studies
- Summary of findings by outcome (child health, nutrition and development)
- Summary of the results of the program theory
- Conclusions.

## **5. Ethical considerations**

The study protocol is under review by the INSP's ethics (NIH registered) and research boards.

## **6. Timeline**

August-September 2009: Identification of articles.

September-December 2009: Data extraction, write-up and dissemination.

## **7. References**

1. Ruel MT, Quisumbing MAR, International Food Policy Research Institute. The Guatemala Community Day Care Program : an example of effective urban programming. Washington, D.C.: International Food Policy Research Institute; 2005.
2. Quisumbing A, Hallman K, Ruel M. Maquiladoras and Market Mamas: Womens Work and Childcare in Guatemala City and Accra. *J Dev Stud.* 2007; 43: 420-55.
3. Zoritch B, Roberts I, Oakley A. Day care for pre-school children. *Cochrane Database Syst Rev.* 2000; CD000564.
4. World Cancer Research Fund, American Institute for Cancer Research. Policy and action for cancer prevention. Food, nutrition, and physical activity: a global

perspective; A project of World Cancer Research Fund International. Washington, DC (USA): World Cancer Research Fund; American Institute for Cancer Research; 2009.

5. Leroy JL, Ruel M, Verhofstadt E. The impact of conditional cash transfer programmes on child nutrition: a review of evidence using a programme theory framework. *Journal of Development Effectiveness*. 2009; 1: 103-29.
6. Rossi PH, Lipsey MW, Freeman HE. *Evaluation : a systematic approach*. 7th ed. Thousand Oaks, CA: Sage Publications; 2004.
7. Bryce J, Victora CG, Habicht JP, Vaughan JP, Black RE. The multi-country evaluation of the integrated management of childhood illness strategy: lessons for the evaluation of public health interventions. *Am J Public Health*. 2004;94: 406-15.

**Appendix 1**

<b>DATABASE SEARCHED:</b> PubMed				
<b>DATE:</b>				
<b>LIMITS:</b> Publication date: 1980 -				
<b>Search Term Syntax Used</b>	<b>Fields Searched</b>	<b># Articles</b>	<b># Kept</b>	<b>Notes</b>
("child care" OR "infant care" OR "child daycare" OR "child day care centres"[MeSH Terms] OR nursery OR nurseries OR nursery school OR nursery schools OR pre-school OR pre-schools OR kindergarten) AND ((health OR infection OR infections OR disease OR diseases OR morbidity OR diarrhea OR diarrhoea) OR (diet OR nutrition OR growth OR height OR weight OR stunting OR wasting OR anemia OR deficiency OR deficiencies OR nutrient OR nutrients) OR (intelligence OR infant development OR child development OR psychomotor OR motor OR sensory OR language OR social OR emotional OR cognitive OR cognition)) AND (child OR children OR preschool child OR preschool children OR infant OR infants) AND (developing country OR third world country OR low income country OR middle income country OR developing nation OR third world nation OR Afghanistan OR Albania OR Algeria OR Samoa OR Angola OR Argentina OR Armenia OR Azerbaijan OR Bangladesh OR Belarus OR Belize OR Benin OR Bhutan OR Bolivia OR Bosnia OR Herzegovina OR Botswana OR Brazil OR	All fields			

<p>Bulgaria OR Burkina Faso OR Volta OR Burundi OR Cambodia OR Cameroon OR Cape Verde OR Central African Republic OR Chad OR Chile OR China OR Colombia OR Comoros OR Congo OR Zaire OR Costa Rica OR Côte d'Ivoire OR Ivory Coast OR Croatia OR Cuba OR Djibouti OR Dominica OR Dominican Republic OR Ecuador OR Egypt OR El Salvador OR Eritrea OR Ethiopia OR Fiji OR Gabon OR Gambia OR Georgia OR Ghana OR Grenada OR Guatemala OR Guinea OR Guyana OR Haiti OR Honduras OR India OR Indonesia OR Iran OR Iraq OR Jamaica OR Jordan OR Kazakhstan OR Kenya OR Kiribati OR Korea OR Kyrgyz Republic OR Kyrgyzstan OR Lao OR Latvia OR Lebanon OR Lesotho OR Liberia OR Libya OR Lithuania OR Macedonia OR Madagascar OR Malawi OR Malaysia OR Maldives OR Mali OR Marshall Islands OR Mauritania OR Mauritius OR Mayotte OR Mexico OR Micronesia OR Moldova OR Mongolia OR Montenegro OR Morocco OR Mozambique OR Myanmar OR Namibia OR Nepal OR Nicaragua OR Niger OR Nigeria OR Pakistan OR Palau OR Panama OR Papua New Guinea OR Paraguay OR Peru OR Philippines OR Poland OR Romania OR Russia OR Russian OR Rwanda OR Samoa OR São Tomé OR Príncipe OR Senegal OR Serbia OR Seychelles OR Sierra Leone OR Solomon Islands OR Somalia OR South Africa OR Sri Lanka OR Kitts OR Nevis OR Lucia OR Vincent OR Grenadines OR Sudan OR Suriname OR Swaziland OR Syrian Arab Republic OR Syria OR Tajikistan OR Tanzania OR Thailand OR Timor-Leste OR Togo OR Tonga OR Tunisia OR Turkey OR Turkmenistan OR Uganda OR Ukraine OR Uruguay OR Uzbekistan OR Vanuatu OR Venezuela OR Vietnam OR West Bank OR Gaza OR Yemen OR Zambia OR Zimbabwe)</p>				
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<b>DATABASE SEARCHED:</b> Econlit				
<b>DATE:</b>				
<b>LIMITS:</b> Publication date: 1980 -				
<b>Search Term Syntax Used</b>	<b>Fields Searched</b>	<b># Articles</b>	<b># Kept</b>	<b>Notes</b>
(child w care OR infant w care OR daycare OR nursery OR nurseries OR nursery w school+ OR pre-school+ OR kindergarten) AND ((health OR infection+ OR disease+ OR morbidity OR diarrhea? OR diarrhoea?) OR (diet OR nutrition OR growth OR height OR weight OR stunting OR wasting OR anemia OR deficiency OR deficiencies OR nutrient*) OR (intelligence OR infant w development OR child w development OR psychomotor OR motor OR sensory OR language OR social OR emotional OR cognitive OR cognition)) AND (child OR children OR preschool child OR preschool children OR infant+) AND (developing w countr* OR third w world w countr* OR low w income w countr* OR middle w income w countr* OR developing w nation+ OR third w world w nation+ OR Afghanistan OR Albania OR Algeria OR Samoa OR Angola OR Argentina OR Armenia OR Azerbaijan OR Bangladesh OR Belarus OR Belize OR Benin OR Bhutan OR Bolivia OR Bosnia OR Herzegovina OR Botswana OR Brazil OR Bulgaria OR Burkina Faso OR Volta OR Burundi OR Cambodia OR Cameroon OR Cape Verde OR Central African Republic OR Chad OR Chile OR China OR Colombia OR Comoros OR Congo OR Zaire OR Costa	Abstract or title or keyword			

<p>Rica OR Côte d'Ivoire OR Ivory Coast OR Croatia OR  Cuba OR Djibouti OR Dominica OR Dominican Republic  OR Ecuador OR Egypt OR El Salvador OR Eritrea OR  Ethiopia OR Fiji OR Gabon OR Gambia OR Georgia OR  Ghana OR Grenada OR Guatemala OR Guinea OR  Guyana OR Haiti OR Honduras OR India OR Indonesia  OR Iran OR Iraq OR Jamaica OR Jordan OR Kazakhstan  OR Kenya OR Kiribati OR Korea OR Kyrgyz Republic OR  Kyrgyzstan OR Lao OR Latvia OR Lebanon OR Lesotho  OR Liberia OR Libya OR Lithuania OR Macedonia OR  Madagascar OR Malawi OR Malaysia OR Maldives OR  Mali OR Marshall Islands OR Mauritania OR Mauritius OR  Mayotte OR Mexico OR Micronesia OR Moldova OR  Mongolia OR Montenegro OR Morocco OR Mozambique  OR Myanmar OR Namibia OR Nepal OR Nicaragua OR  Niger OR Nigeria OR Pakistan OR Palau OR Panama OR  Papua New Guinea OR Paraguay OR Peru OR Philippines  OR Poland OR Romania OR Russia? OR Rwanda OR  Samoa OR São Tomé OR Príncipe OR Senegal OR Serbia  OR Seychelles OR Sierra Leone OR Solomon Islands OR  Somalia OR South Africa OR Sri Lanka OR Kitts OR  Nevis OR Lucia OR Vincent OR Grenadines OR Sudan OR  Suriname OR Swaziland OR Syrian Arab Republic OR  Syria OR Tajikistan OR Tanzania OR Thailand OR Timor-  Leste OR Togo OR Tonga OR Tunisia OR Turkey OR  Turkmenistan OR Uganda OR Ukraine OR Uruguay OR  Uzbekistan OR Vanuatu OR Venezuela OR Vietnam OR  West Bank OR Gaza OR Yemen OR Zambia OR  Zimbabwe)</p>				
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